Wnt5a knock-out mouse as a new model of anorectal malformation.

Journal: J Surg Res

Publication Year: 2009

Authors: Cindy C Tai, Frederic G Sala, Henri R Ford, Kasper S Wang, Changgong Li, Parviz Minoo, Tracy C Grikscheit, Saverio Bellusci

PubMed link: 19577771

Funding Grants: Mechanism of Tissue Engineered Small Intestine Formation, Training Grant 1

Public Summary:

Scientific Abstract:
BACKGROUND: Anorectal malformations (ARM) represent a variety of congenital disorders that involve abnormal termination of the anorectum. Mutations in Shh signaling and Fgf10 produce a variety of ARM phenotypes. Wnt signaling has been shown to be crucial during gastrointestinal development. We therefore hypothesized that Wnt5a may play a role in anorectal development. METHODS: Wild type (WT), Wnt5a(+/-) and Wnt5a(-/-) embryos were harvested from timed pregnant mice from E15.5 to E18.5, and analyzed for anorectal phenotype. Tissues were processed for whole-mount in situ hybridization and histology. RESULTS: Wnt5a is expressed in the embryonic WT colon and rectum. Wnt5a(-/-) mutants exhibit multiple deformities including anorectal malformation. A fistula between the urinary and intestinal tracts can be identified as early as E15.5. By E18.5, the majority of the Wnt5a(-/-) mutants display a blind-ending pouch of the distal gut. CONCLUSIONS: The expression pattern of Wnt5a and the ARM phenotype seen in Wnt5a(-/-) mutants demonstrate the critical role of Wnt5a during anorectal development. This study establishes a new model of ARM involving the Wnt5a pathway.

Source URL: https://www.cirm.ca.gov/about-cirm/publications/wnt5a-knock-out-mouse-new-model-anorectal-malformation